



# Blueberry Newsletter

A newsletter from Michigan State University for the Michigan blueberry industry

August 30, 2011

Volume 5, Issue 10

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*Timely information for growers.*

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## News you can use

**Crop development.** In Van Buren County, second harvest in Jersey in Covert is complete and some fields may be harvested a final time. Bluecrop and Blueray harvest in Grand Junction is complete.

In Ottawa County, Bluecrop in West Olive is at the end of third harvest, and some fields will be machine harvested a final time.

**Insect management.** Spotted wing Drosophila has been detected in a few post-harvested fields - keep checking your traps. Blueberry maggot flies are still present in some fields.

**Disease management.** Blueberry leaf rust has been seen in Michigan fields. Check leaves for reddish-brown spots with yellow to orange rust pustules on the lower leaf surface. If rust is found, one to two fungicide sprays should be sufficient to arrest the disease.

**Thank you.** I have very much enjoyed working with you over the last several years. Thank you for the opportunity.  
-P.J.



Bluecrop in West Olive



Jersey in Covert

### GROWING DEGREE DAYS

From March 1

	2011		Last Year	
	Base 42	Base 50	Base 42	Base 50
<b>Grand Junction, MI</b>				
8/22	3374	2337	3767	2627
8/29	3570	2474	3960	2763
Projected for 9/5	3786	2634	4160	2909
<b>West Olive, MI</b>				
8/22	3082	2094	3486	2374
8/29	3267	2223	3668	2501
Projected for 9/5	3477	2377	3857	2635

See <http://enviroweather.msu.edu> for more information.

## Blueberries are finishing in SW Michigan

Mark Longstroth

Michigan State University Extension

Van Buren County

Last week's weather was pleasant and dry with highs near 80 and lows in the 50s. This week is forecast to have highs climbing through the 80s to near 90 and then drop to 70 after the weekend. There was little rain last week and soils are beginning to dry.

Blueberry harvest is ending. Most growers have finished Elliotts, reporting low yields and poor berry size from later pickings. Overall most growers are disappointed by the poor yields in 2011. [Spotted wing drosophila](#) numbers should spike upwards in blueberries and other small fruit as insecticide applications end after harvest and populations will build in unharvested fruit. While trap catches have been low it seems likely that there is a small and scattered population in the wild and abandoned blueberries in SW Michigan. Last year we saw a steady rise of this small vinegar fly in the fall and I would expect that we will see the same this year. Unless you know that you have this pest it makes little sense to spray for it. Now is the time to think about setting up the fields for next year. Fall is a good time to apply residual herbicides, see the article on fall weed control by Eric Hanson for some excellent suggestions. Another need may be irrigation. Blueberry plants are just starting to set flower buds for next year. With all the rain this year most growers have lots of new growth and the potential for a heavy crop next year. Be sure to keep soils moist in September. If the soil dries out the plants will shut down reducing the number of flower buds set in September. Unless we are really dry, the fall rains should start in October and no irrigation should be necessary later. Early fall is not a good time to fertilize as we want the shoot tips to set flower buds not start new growth. Keep an eye

out for diseases. Indar is probably the best choice if you have blueberry rust. Be sure you have rust by examining the bottom of the leaves for the yellow fruit bodies of the fungus. A fall application of a protectant material such as Bravo or Sulfurix before the rainy season begins will provide a degree of protection to new growth and flower buds.

## Central region small fruit report

Carlos Garcia-Salazar

Michigan State University Extension

Ottawa County

Raspberry and black berry production is on the rise in West Michigan. The berry harvest has continued in West Michigan. At this time raspberries, blackberries and blueberries are the main crops that are being harvested. So far, raspberries are becoming one of the major small fruit crops in West Michigan, more raspberries are harvested this year than in previous seasons. There are two reasons for this increase. First, there are new plantings in Kent, Ottawa, Allegan, Ionia, and Allegan County. These are 1 to 2 acre plots added to other berry production fields already exploited by berry growers (blueberry and strawberry growers, mainly). Especially for growers with U-pick operations or fruit stands, the addition of raspberries and blackberries to their fruit farm has been a smart addition. The only downside is that raspberries as well as blackberries have a very short shelf-life and growers need to harvest daily. If not enough customers are available at harvest time these berries need to be kept in cold storage until a buyer is found. There are at least 3 new raspberry plantings in Ottawa County, all of them operated by blueberry growers.

Currently, major problems facing raspberry and blackberry production are weather and Japanese beetle. Hot weather that has prevailed for the last 15 days has created a problem for berry production as it accelerated fruit

ripening and fruit rots. Some growers are having more berries than buyers and fruit rots are taking 10 to 15% of the fruit harvested. The Japanese beetle also deterred some clients from harvesting at U-pick farms. Some people are not willing to tolerate this nuisance while harvesting. However, fewer losses are reported due to Japanese beetle damage. Most of the losses are related to the need to apply pesticides to maintain beetles away from the crop, and the loss of customers.

For blueberries, the main variety harvested at this time is Elliott. In Allegan County, growers are already in the fourth hand harvests. But north of Allegan, Elliott fields are in the 2<sup>nd</sup> and 3<sup>rd</sup> hand harvests. Because of the size of the 2011 crop, blueberry prices for fresh blueberries are reaching more than \$1.80 per pound. However, because of the light crop many growers are paying pickers up to \$ 0.70 per pound. That is making blueberries more expensive for consumers. So far, the size of the 2011 crop remains below 70% of the 2010 crop. Problems reported by growers are mainly related to production.

## Last Michigan Blueberry Newsletter

Rufus Isaacs

Department of Entomology

Michigan State University

This is the final edition of the Michigan Blueberry Newsletter. It is difficult to write those words, because this newsletter has become a major component of our seasonal extension programming, and a lot of hard work has gone into maintaining the timely delivery of quality information to Michigan's blueberry industry. The Michigan Blueberry Newsletter was first published on April 17, 2007 after the MSU Blueberry Team received funding from the regional EPA office for a project to enhance delivery of IPM information to the region's blueberry growers. Since then, over 80 editions of the newsletter have been published. In the first few

years, Keith Mason and Tim Miles scouted fields each week for insects and diseases and then prepared scouting reports for the newsletter that Keith sent out. Feedback from growers, scouts, and consultants was positive and so we continued this project after the EPA grant ended, bringing Paul Jenkins on board to update and deliver the newsletter. With support from the USDA, MBG Marketing, and the Michigan Blueberry Blueberry Advisory Committee this newsletter has continued, with the distribution list swelling to over 400 email addresses around the state and beyond. Despite

the success of the newsletter, it is ending this year. Paul has moved to a grape-specific job description at MSU and MSU Extension is moving its information delivery to online electronic format, through the MSU Extension News for Agriculture site at the [news.msue.msu.edu](http://news.msue.msu.edu) website. With these changes come some opportunities, and so with funding from the North Central IPM Program, the Blueberry Team at MSU is working with the IPM program staff to revamp the blueberry website. This will soon be a modern-looking site that has a blueberry-related news feed showing all the blueberry articles from

MSU. So, instead of an emailed report there will be a dedicated website. MSU staff will still be delivering regional reports, scouting updates, and pest-specific information, but it will just be coming in a different format. Hopefully this change will go smoothly and we hope to have a version of the new system to show off well before the 2012 season. Until then, good luck with the end of harvest!

## W E E D M A N A G E M E N T

## Fall weed management in blueberries

*Eric Hanson  
Department of Horticulture  
Michigan State University*

Fall can be an important time to control weeds. Here are a few tasks that should pay off in the future.

**Scout your fields.** Spend some time after harvest walking fields and recording weed pressure and determine how successful your spring preemergent herbicides were. Note where control was good and poor, and which weeds are present, particularly where perennial weeds have become

established. Birds drop seeds of many noxious perennials (Virginia creeper vine, grapevine, poison ivy) in blueberry fields, so even clean fields need to be monitored for new weeds. Is weed pressure related to the soil type or herbicides used last spring? This information will help in formulating a weed management program for next spring. Are rows completely devoid of weeds in the fall? This might indicate too much herbicide was used the previous spring. Some annual weeds should begin establishing in the fall if rates are optimum.

**Treat tough perennial weeds.** Late summer and fall is a good time to work on tough to control perennial weeds such as virginia creeper vine (Fig. 1),

grapevine (Fig. 2), milkweed, goldenrod, poison ivy (Fig. 3), and brambles. These perennials generally do not respond to soil applied herbicides, but can be managed by careful applications of glyphosate (e.g Roundup) late in the summer. Glyphosate is effective on these weeds, but can also kill blueberries. Perennial weeds are killed because the chemical moves to below-ground plant parts. Treat before weed leaves senesce. Virginia creeper vine, for example, drops leaves early in the fall. For spot spraying perennials:

1. Use 2% glyphosate solutions
2. Add ammonium sulfate to improve absorption



Fig 1. Virginia creeper; Photo: E. Hanson.



Fig 2. Wild grapevine; Photo: E. Hanson.



Fig 3. Poison ivy; Photo: E. Hanson.

Table 1. Effect of herbicides applied in the fall 2010 and spring 2011 on weed cover in summer 2011. 'Duke' field, South Haven, Michigan.

Product	Rate lb ai/acre	Date	Weed cover (%)	
			15 June	1 Aug
Control			98	100
Princep 90 + Sinbar 80W	2; 1	Nov 11	52	100
Princep 90 + Solicam 80DF	2; 2	Nov 11	3	27
Chateau 51%	0.38	Nov 11	6	16
Princep 90 + Sinbar 80W	2; 1	April 1	87	100
Princep 90 + Solicam 80DF	2; 2	April 1	83	90
Chateau 51%	0.38	April 1	2	13
Callisto 4SC	0.188	May 10	42	90
Callisto 4SC + Sinbar 80W	0.094; 1	May 10	2	10
Callisto 4SC + Solicam 80W	0.094; 2	May 10	6	33
Sandea 75WDG	0.047	May 10	37	98
Sandea 75WDG + Sinbar 80W	0.047; 1	May 10	1	17

3. Avoid all green blueberry tissues
4. Apply when weeds are still green
5. Spray at low pressure to limit drift

Use extreme care not to contact green blueberry tissues (stems and leaves) with glyphosate. Glyphosate absorbed by blueberry leaves and green bark moves within the bush and can kill whole canes or bushes. Weeds such as blackberry, Virginia creeper, and grapevine may need to be pulled out of bushes so they can be treated safely. This may seem too slow to be practical, but consider what these weeds cost in lost income. Bushes covered by Virginia creeper vine may yield just 20% of their potential. This easily equates to a \$ 5-10 loss per bush. The loss is incurred each year and increases as the vines spread to neighboring bushes. Investing 15 minutes to carefully pull vines out of that bush and safely treat them on the ground is money well spent.

**Fall application of preemergent herbicides.** October/November is often an effective time to apply preemergent herbicides. Fall is less busy than spring for most growers and often we have periods of good conditions in the fall. In recent years, rainy periods in the spring have hampered herbicide applications and sometimes delayed applications until after weeds have established so control is poor. Over the last three years, we have compared spring and fall applications of several standard

herbicides. Most provided comparable control in both seasons. Fall may be better than the spring for control of some weeds. Marestalk, for example, can emerge in the fall, so spring applications are too late for control.

Consider experimenting with fall applications. Chateau and Solicam are good candidates for the fall, particularly in combination with older materials such as Karmex or Princep. Results of a trial this year (Table 1) showed that fall applications of Solicam plus Princep or Chateau alone provided good weed control through early August. The primary weeds present in this study were red sorrel, common crabgrass, common chickweed, Pennsylvania smartweed and horsenettle. Other trials indicate that fall applications of Karmex, Princep, and Solicam are as effective as spring applications.

# Insect update

*Keith Mason & Rufus Isaacs  
Department of Entomology  
Michigan State University*

The activity period is ending for most pest insects, and scouting for most pests is not necessary after harvest. Growers and scouts should note where pest insects were present to help make pest management plans for next season.

Blueberry aphids have not been seen in the fields we monitor for two weeks or more and only a few parasitized aphids were seen during scouting.

Blueberry maggot flies were captured at the West Olive farm over the past two weeks, but numbers are low and declining even more. We are still receiving reports of low captures of blueberry maggot flies at several other blueberry farms in southwest Michigan. Blueberry maggot traps can be removed after harvest. See the article in the June 28, 2011 edition of The Michigan Blueberry IPM Newsletter for additional information on monitoring and control of blueberry maggot.

Japanese beetles have been scarce for the past two weeks in the fields we scouted. Most fields are through with harvest and Japanese beetles have declined. One beetle was seen at the West Olive farm on 22 August, but no beetles were seen at any of the farms we scouted on 29 August. In fields that are finished with harvest, growers should consider measures to control perennial weeds such as five-leaf ivy and wild grape. These perennial plants that are very attractive to beetles and are a host for Spotted Wing Drosophila can be effectively controlled with fall herbicide applications, and this may help reduce the numbers of these pests next year. See the Article by Eric Hanson (MSU Horticulture) for more on [fall weed control in blueberries](#).

The number of spotted wing drosophila (SWD) flies that have been trapped at farms in southwest Michigan is slowly increasing. Most of these flies have been caught in or near minimally managed

Table 1. Insect scouting results.

Farm	Date	CFW moths per trap	CBFW moths per trap	BBA infested shoots (%)	SWD adults per trap	BBM adults per trap	JB per 20 bushes
<b>VAN BUREN COUNTY</b>							
Covert	8/22	-	-	0	0	0	0
	8/29	-	-	0	0	0	0
Grand Junction	8/22	-	-	0	0	0	0
	8/29	-	-	0	1	0	0
<b>OTTAWA COUNTY</b>							
West Olive	8/22	-	-	0	0	1	1
	8/29	-	-	0	0	1	0

CFW=cherry fruitworm; CBFW=cranberry fruitworm; BBA=blueberry aphid; SWD=spotted wing drosophila; BBM=blueberry maggot; JB=Japanese beetle

blueberry fields, but some flies have been caught in conventionally managed fields after harvest. For example a fly was captured this week at the Grand Junction farm. For more details about recent captures of SWD in southwest Michigan see the article in this edition of the Michigan Blueberry IPM Newsletter. For more information about this invasive pest, please check out the MSU spotted wing Drosophila page at [www.ipm.msu.edu/SWD.htm](http://www.ipm.msu.edu/SWD.htm).

## Late-season increase in Spotted Wing drosophila catches

*Rufus Isaacs  
Department of Entomology  
Michigan State University*

As expected, the more moderate weather conditions and higher abundance of ripe fruit in late August has brought increasing activity of spotted wing Drosophila (SWD) flies. The increase has been gradual and still most of the traps in the SWD monitoring network are not catching flies. There remain large regions of the state (west central, NW, central, and SE Michigan) that have traps being checked but where we have not yet detected SWD this season. Detections of SWD have been made during the past week in Berrien, Van Buren, Allegan, Ottawa, and Muskegon counties where our monitoring is most intense (over 150 traps). These positive detections have

been in peach, cherry, blueberry, and grape sites.

Where flies have been caught, counts per trap are generally quite low (often one or two flies and all are fewer than ten flies per trap). At this time of the season many fields of susceptible fruit crops are post-harvest and the relaxation in pest control activities is providing an opportunity for greater fly survival. Additionally, the fruit of some wild host plants adjacent to crop fields are becoming ripe, and we suspect those are providing opportunities for SWD development.

Growers with fall-harvested fruit crops that are susceptible to SWD should be monitoring fields using either apple cider vinegar or sugar-yeast solution as the bait. See our SWD website at [www.ipm.msu.edu/SWD.htm](http://www.ipm.msu.edu/SWD.htm) for guidance on constructing, checking, and servicing traps. The yeast bait can be made with a mixture of 4 Tbsp sugar: 1 Tbsp active dry yeast: 12 oz water. In the past week, we have caught many more SWD flies in traps using yeast-baited traps compared with apple cider vinegar-baited traps. However, the apple cider vinegar is definitely easier to work with than the yeast.

The situations where growers should be most concerned about detection of SWD flies include farms with multiple varieties where the early varieties are harvested but some later varieties remain to be picked. This is currently seen in raspberry, blueberry, and peach

farms. If SWD is detected in such locations, the later harvested varieties should be protected from SWD infestation. From earlier work in western states and from our 2011 research in Michigan, the best-performing insecticides for SWD control are Delegate, Malathion, Imidan, and Lannate. For organic growers, 2 oz/acre of Entrust is the most effective option. Pyrethroids such as Mustang Max worked very well in our lab studies this spring, but were less effective in field trials conducted during the heat of the summer when air temperatures were in the 80s. We have therefore reduced our ranking of pyrethroids until we have

more information on their field performance. It is possible that the current cooler temperatures in late August and September will improve pyrethroid efficacy, but that remains unknown. If growers do decide to make an application for SWD control be sure to pay close attention to the PHI and season limit restrictions, be aware of any MRL restrictions for particular products if exporting fruit, and make the application with the sprayer calibrated and using sufficient water to reach into the canopy and to the bottom of the canopy where the flies prefer to spend their time.

## Leaf rust spotted in Michigan blueberry fields

*Annemiek Schilder*

*Department of Plant Pathology  
Michigan State University*

Over the last week or two, blueberry leaf rust has been noticed in blueberry fields in various locations in Michigan. Blueberry leaf rust has been on the increase in Michigan in recent years, due to favorable weather conditions for the disease over the past years. Rainy periods in mid- to late summer as well as longer dew periods are conducive to disease development. It also occasionally shows up on blueberry plants grown in the greenhouse. Leaf rust is caused by the fungus *Thekopsora minima*. Small yellow spots appear on leaves between July and September and then turn brown with a darker border. On older leaves, lesions may be surrounded by red or purplish discoloration or, when leaves are about to senesce, rust spots may actually be surrounded by green areas (“green island effect”) as the fungus needs the leaf to stay alive to be able to reproduce itself.

On the lower leaf surface, yellow to orange powdery pustules (uredia) are visible with the naked eye or hand lens.

These contain infective spores and, when touched, the spores come off. Leaf rust can rapidly increase towards the end of the season under warm, wet conditions. It generally has little impact on current-season yield, but may cause premature defoliation. Severe defoliation has the potential to reduce fruitfulness of new buds and/or winterhardiness of the canes. No studies have been done on yield loss in blueberries due to leaf rust.

Some growers believe that low yields observed in 2011 were caused by leaf rust. This is not necessarily the case; low yields may have more to do with environmental conditions affecting bud set. Heavy crop load one year may also affect fruitfulness the following year. Unless you observed rust pustules and associated premature defoliation, you cannot assume that rust was the cause of low yield potential. In addition, other factors can lead to premature defoliation, such as drought stress, chemical injury, *Phytophthora* root rot and *Armillaria* root rot. If you see reddish or yellowish leaves dropping without orange rust pustules, it is most likely not leaf rust.

**Biology.** The disease has probably been present in Michigan for a long time on wild blueberries. The rust fungus needs

a live host to perpetuate itself. The alternate host of the fungus is the hemlock (*Tsuga* spp.), which explains why the rust tends to be more severe in the vicinity of hemlock trees. The hemlock plays an essential part in the life cycle of the fungus. In spring, spores produced in overwintered blueberry leaves on the ground below blueberry bushes become airborne and infect hemlock needles. This infection may be difficult to see but infected needles turn yellow and have cream-colored tube-like projections hanging from them on the lower surface. Spores from these are airborne and infect blueberry leaves anytime from July to August. Once blueberry leaves are infected, spores produced in the rust pustules are spread by wind and re-infect blueberry leaves in the presence of water from rain, dew, or overhead irrigation. There can be repeated cycles of infection as long as conditions are conducive. In the fall, the fungus drops to the ground with the leaves and overwinters in the field until the next growing season. In regions where green leaves are present year round (e.g., in the southern US, Mexico or greenhouses), hemlock trees are not needed to close the life cycle.

**Management.** Removing all hemlock trees within ½ mile from a blueberry field would break the rust life cycle but



Fig 4. Necrotic spots on upper leaf surface where rust colonies are present. Note yellow halo around some of the lesions; Photo: A. Schilder.



Fig 5. Older (darker) and younger (lighter) lesions on upper leaf surface indicating leaf rust infection; Photo: A. Schilder.



Fig 6. Lower leaf surface showing orange spore masses in rust lesions; Photo: A. Schilder.



Fig 7. Moderately severe rust infection. Note lighter green spots surrounded by purple-brown discoloration. The rust fungus is trying to keep the leaf area where it is located alive as long as possible; Photo: A. Schilder.



Fig 8. Many rust pustules on lower leaf surface; Photo: A. Schilder.



Fig 9. Larger necrotic areas on blueberry leaf where rust colonies have coalesced; Photo: A. Schilder.

is neither desirable nor practical. Besides, hemlocks are a beautiful part of the Michigan landscape. Raking or vacuuming and burning blueberry leaves after leaf drop in the fall can reduce inoculum carry-over. Minimize leaf wetness by adjusting timing of overhead irrigation and apply effective fungicides in mid- to late summer. Even though fungicides have not been tested for blueberry rust control in Michigan, the sterol inhibitors are usually highly effective against rusts. At this time, most of the blueberry harvest has been completed which is important as the most effective fungicides have long pre-harvest intervals. Both Indar (fenbuconazole) and Orbit (propiconazole) are labeled for rust control in blueberries and have a 30-day PHI. Bravo (chlorothalonil) is also labeled for rust control and has a 42-day PHI. However, after harvest, all of these fungicides can be sprayed provided that the maximum number of

sprays per season is not exceeded. A tankmix of a sterol inhibitor fungicide (e.g., Indar or Orbit) with a half rate of Bravo is another option for both protectant and curative activity. Sonata (*Bacillus pumilis*), an organic biofungicide with a 0-day PHI is also labeled for blueberry rust control – adding a spreader-sticker may improve efficacy. Cabrio (pyraclostrobin) and Pristine (pyraclostrobin + boscalid) are labeled for rust “suppression” and are not recommended for rust control except during the harvest season when other products cannot be used. Dormant lime sulfur applied to the overwintering leaves on the ground in the fall or spring may be helpful but efficacy has not been confirmed.

## 2011-12 Grower Events

### **Great Lakes Fruit, Vegetable, and Farm Market Expo**

December 6-8, 2011

DeVos Place Convention Center, Grand Rapids

### **SW Hort Days**

Early February, 2012

Lake Michigan College, Benton Harbor

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